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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 09/819,395      | 03/28/2001  | Takashi Kaku         | FUJZ 18.525         | 7108             |
| 26304           | 7590        | 07/12/2005           |                     | EXAMINER         |
|                 |             |                      |                     | AHN, SAM K       |
|                 |             |                      | ART UNIT            | PAPER NUMBER     |
|                 |             |                      | 2637                |                  |

DATE MAILED: 07/12/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

|                              |                 |              |  |
|------------------------------|-----------------|--------------|--|
| <b>Office Action Summary</b> | Application No. | Applicant(s) |  |
|                              | 09/819,395      | KAKU ET AL.  |  |
|                              | Examiner        | Art Unit     |  |
|                              | Sam K. Ahn      | 2637         |  |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

1) Responsive to communication(s) filed on amendment, 06/24/05.

2a) This action is **FINAL**.                                   2b) This action is non-final.

3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

4) Claim(s) 2-12 and 14-27 is/are pending in the application.

4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.

5) Claim(s) \_\_\_\_\_ is/are allowed.

6) Claim(s) 2-6,12,14-18,24,26 and 27 is/are rejected.

7) Claim(s) 7-11,19-23 and 25 is/are objected to.

8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

9) The specification is objected to by the Examiner.

10) The drawing(s) filed on \_\_\_\_\_ is/are: a) accepted or b) objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a) All    b) Some \* c) None of:

1. Certified copies of the priority documents have been received.
2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

1) Notice of References Cited (PTO-892)

2) Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 62405.

4) Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.

5) Notice of Informal Patent Application (PTO-152)

6) Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 06/24/05 has been entered.

### ***Response to Arguments***

2. Applicant's arguments, see p.10, filed 06/24/05, with respect to the rejection(s) of claim(s) 2,3,5,12,14,15,17 and 24 under 102(e) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Rudolph and Carneheim.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 2-6,12,14-18,24,26 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rudolph et al. U.S. Pat. No. 6,501,804 B1 (Rudolph, cited previously) in view of Carneheim et al. USP 6,215,798 B1 (Carneheim).

Regarding claims 2,14,26 and 27, Rudolph discloses a noise canceling method and apparatus (see Fig.1a and 1b) comprising, interpolating a noise component of the received signal (note col.3, lines 4-9 and col.4, lines 9-28), and means for canceling or subtracting the noise component from the received signal (see 88 in Fig.1b and note col.4, lines 58-62).

Although Rudolph teaches inserting a sequence of bits into a signal on a transmission side, Rudolph does not teach extracting the zero-point based on the established synchronization.

Carneheim teaches periodically inserting a bit into signal (synchronization bit, 310 in Fig.3) on a transmission side, establishing synchronization based on a received signal (400 in Fig.4), extracting the bit (410 in Fig.4) based on the established synchronization. And although Carneheim does not explicitly teach a zero-point, Carneheim teaches zeros are also used for synchronization (note col.1, lines 59-61). Applicant has not disclosed that zeros or zero-point provides an advantage, is used for a particular purpose or solves a stated problem. One of ordinary skill in the art, furthermore, would have expected Applicant's invention to perform equally well with inserting a bit representing one or mixture of ones and zeros because synchronizing bits are known at the receiver end. Therefore, it would have been obvious to one of ordinary skill in this art to modify the teaching

of Carneheim having only zeros to represent synchronization bits to obtain the invention as specified in the claim.

Furthermore, it would have been obvious to one skilled in the art at the time of the invention to incorporate the teaching of Carneheim in the system of Rudolph by transmitting the synchronization bits of Carneheim on the transmission side for the purpose of properly aligning the received signal or establishing synchronization, as taught by Carneheim (note col.2, lines 26-31).

Regarding claims 3 and 15, Rudolph in view of Carneheim teach all subject matter claimed, as applied to claim 2 or 14. Rudolph further teaches wherein one or more zero-points are inserted at intervals of an integer number of samples. (see Fig.2b wherein the test sequences are inserted at interval of one data block)

Regarding claims 4 and 16, Rudolph in view of Carneheim teach all subject matter claimed, as applied to claims 3 or 15. Rudolph further teaches wherein the test sequences are variable, since data block may be replaced by a gap when greater periodic interval is used, (note col.2, lines 43-65). And although Rudolph does not teach wherein the variable test sequences interval is determined by the signal quality, it would have been obvious to one skilled in the art at the time of the invention to increase and decrease the number of test sequences being transmitted to the receiver depending on the signal quality as

the purpose of test sequences are to eliminate noise. Therefore, during heavy noise in the signal received, frequent test sequences may be transmitted. And furthermore, since the transmitter is not aware of the signal quality received by the receiver, the receiver sending the information to the transmitter in regards to the signal quality is well-known in the art. Therefore, it would have been obvious to one skilled in the art at the time of the invention to inform the signal quality received to the transmitter for the purpose of adjusting the frequency of test sequences to be transmitted.

Regarding claims 5 and 17, Rudolph in view of Carneheim teach all subject matter claimed, as applied to claims 2 or 14. Rudolph further teaches implementation of the noise canceling system in a digital broadcasting environment using AM bands. (note col.1, lines 6-10) And therefore, it is inherent that the system of Rudolph is implemented in a wireless environment having a transparent transmission line transceiving using AM bands.

Regarding claims 6 and 18, Rudolph in view of Carneheim teach all subject matter claimed, as applied to claims 5 or 17. And although Rudolph does not teach wherein the transparent transmission line comprises a Nyquist transmission line, it would have been obvious to one skilled in the art at the time of the invention to design a system having a Nyquist transmission line for the purpose of supporting a well-known Nyquist theorem.

Regarding claims 12 and 24, Rudolph in view of Carneheim teach all subject matter claimed, as applied to claims 2 or 14. Rudolph further teaches wherein an automatic equalizer (note col.3, lines 10-13 eliminating the noise from the received signal) may be provided at a former or latter stage of a noise cancellation, wherein the equalizer is well-known in the art to be used as a function to remove intersymbol interference.

***Allowable Subject Matter***

4. Claims 7-11, 19-23 and 25 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims, and overcome the claim objections.
5. The following is a statement of reasons for the indication of allowable subject matter:  
Present application discloses a noise canceling system comprising transmission of zero-points along with the data in the signal. The zero-points are inserted where the number of insertions may be variable depending on the signal quality. The receiver uses the zero-points to detect the noise and cancel the noise from the signal received. Closest prior art, Rudolph teaches all subject matter claimed. However, Rudolph does not teach or suggest in combination wherein during the detection of noise, interpolation is performed comprising shifting the frequency of the signal,

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decimating, and further shifting the frequency in order to generate the noise from the signal received in order to properly cancel the noise.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sam Ahn whose telephone number is (571) 272-3044. The examiner can normally be reached on Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jay Patel can be reached on (571) 272-2988. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Sam K. Ahn  
7/8/05

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PRIMARY EXAMINER  
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